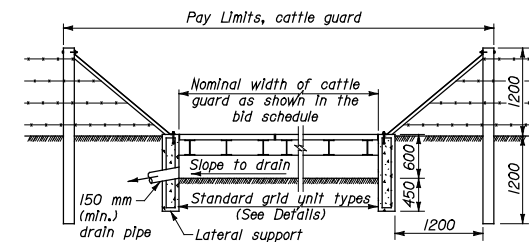


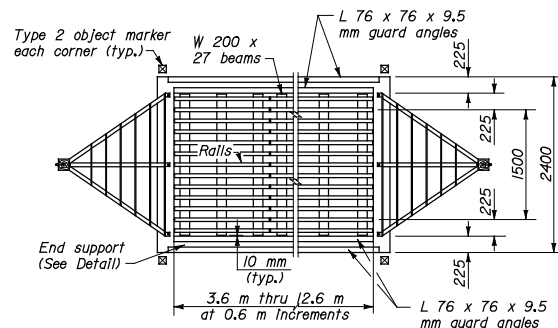
| REG | STATE | PROJECT | SHEET NO. | TOTAL SHEETS |
|-----|-------|---------|-----------|--------------|
| | | | | |

NOTE:

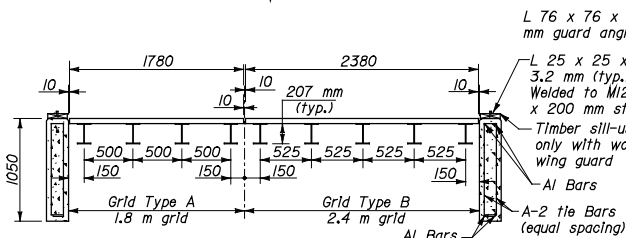
1. Dimensions not labeled are in millimeters.
2. **LOADING:** AASHTO MS18.
3. **CONCRETE:** Chamfer exposed edges 20 mm unless otherwise shown. Give all concrete surfaces a Class I finish.
4. **STRUCTURAL STEEL:** Rails conform to the requirements for ASCE 40 crane rail. Structural steel for alternate sections conforms to ASTM A 500, Grade B, Copper Steel or ASTM A 618, Grade 2. If the steel does not contain a minimum of 0.2 percent copper, galvanize the alternate sections. All other structural steel conforms to AASHTO M 183 and is painted.
5. The minimum concrete cover to the face of any bar is 50 mm unless otherwise shown. All bars are #13.
6. All welds are continuous 6 mm fillet shop welds. Weld rail or alternate sections on both sides to the W 200 x 27 beams at each intersection. All welding conforms to Section 555.
7. Use aluminum alloy 6061-T6 or 6063-T6 for aluminum tubing.
8. All timber conforms to AASHTO M 16B, and is treated with chromated copper arsenate according to AASHTO M 133.
9. Galvanize all hardware according to AASHTO M 111.
10. Construct the cattle guard to conform with the finished roadway grade and template.
11. Place one object marker at each corner of the cattle guard as shown. Mount object markers on 100 x 100 x 1950 mm posts with the reflector located 1050 mm above the elevation of the lateral support concrete.
12. Install drain pipe as shown where required. Drain pipe is included in cattle guard unless otherwise shown.
13. Unless otherwise shown in the special contract requirements, shop apply paint system 2 according to Section 555 and color the top coat according to Federal Standard 595B, Gray, 36231. Repair any damage to the paint system during installation.
14. Install channels and wood blocking on cattle guards wider than 4.8 m to maintain grate spacing as shown on Standard M619-2.
15. See Standard M619-3 for optional precast foundation details.



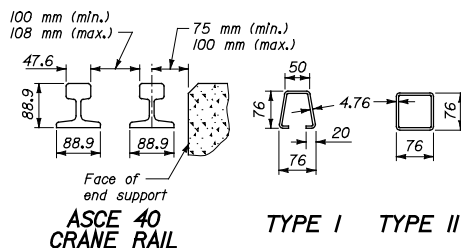
SECTION VIEW



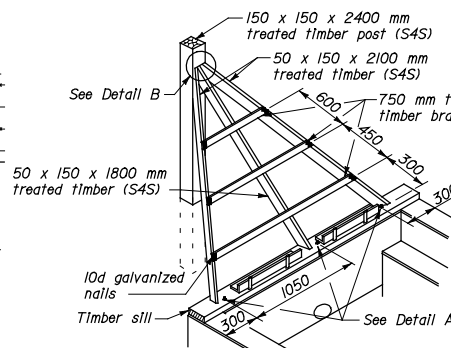
PLAN



STANDARD GRID UNIT TYPES



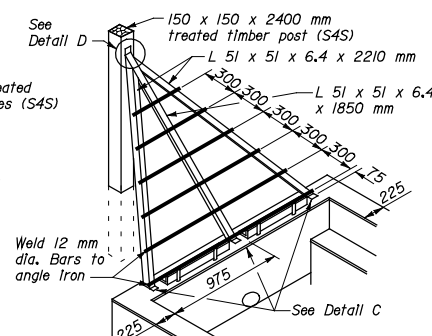
ACCEPTABLE ALTERNATE RAIL



DETAIL A

DETAIL B

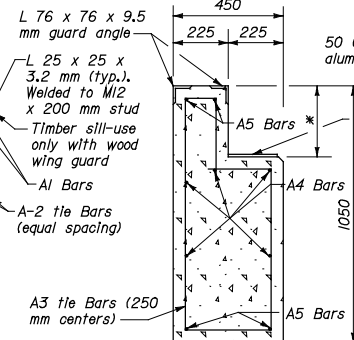
WOOD WING GUARD



DETAIL C

DETAIL D

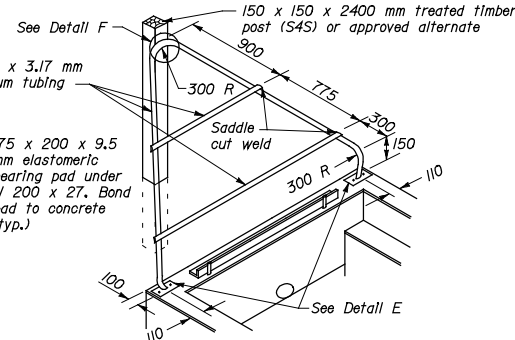
ANGLE IRON WING GUARD



END SUPPORT DETAIL
(*13 Reinforcing Bars)



GUARD ANGLE DETAIL
(4 required per cattle guard)



DETAIL E

DETAIL F

ALUMINUM TUBING WING GUARD NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY OFFICE

METRIC STANDARD CATTLE GUARD

STANDARD APPROVED FOR USE 05/96

REVISED 6/97

STANDARD
M619-1